



Introduction to Business Valuation

Course Instructor - Jeff



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About Jeff...

Prior to joining CFI, for over a decade Jeff taught financial modeling and valuation to thousands of students all over the world. Before his career in financial education, Jeff covered approximately 50 companies with a combined market cap of \$500 billion during his career in equity research. He also worked in corporate development leading M&A modeling and due diligence, and FP&A, as well as working in investment banking and restructuring. Jeff has a B.S. from Texas A&M University and obtained his MBA from the University of Houston. He is a CFA charterholder.

Learning Objectives



Identify a wide range of valuation methods.



Understand the difference between enterprise value and equity value.



Explore the three main business valuation techniques.



Determine the pros and cons of different valuation methods.



Discover how to present your analysis like a world-class financial analyst.

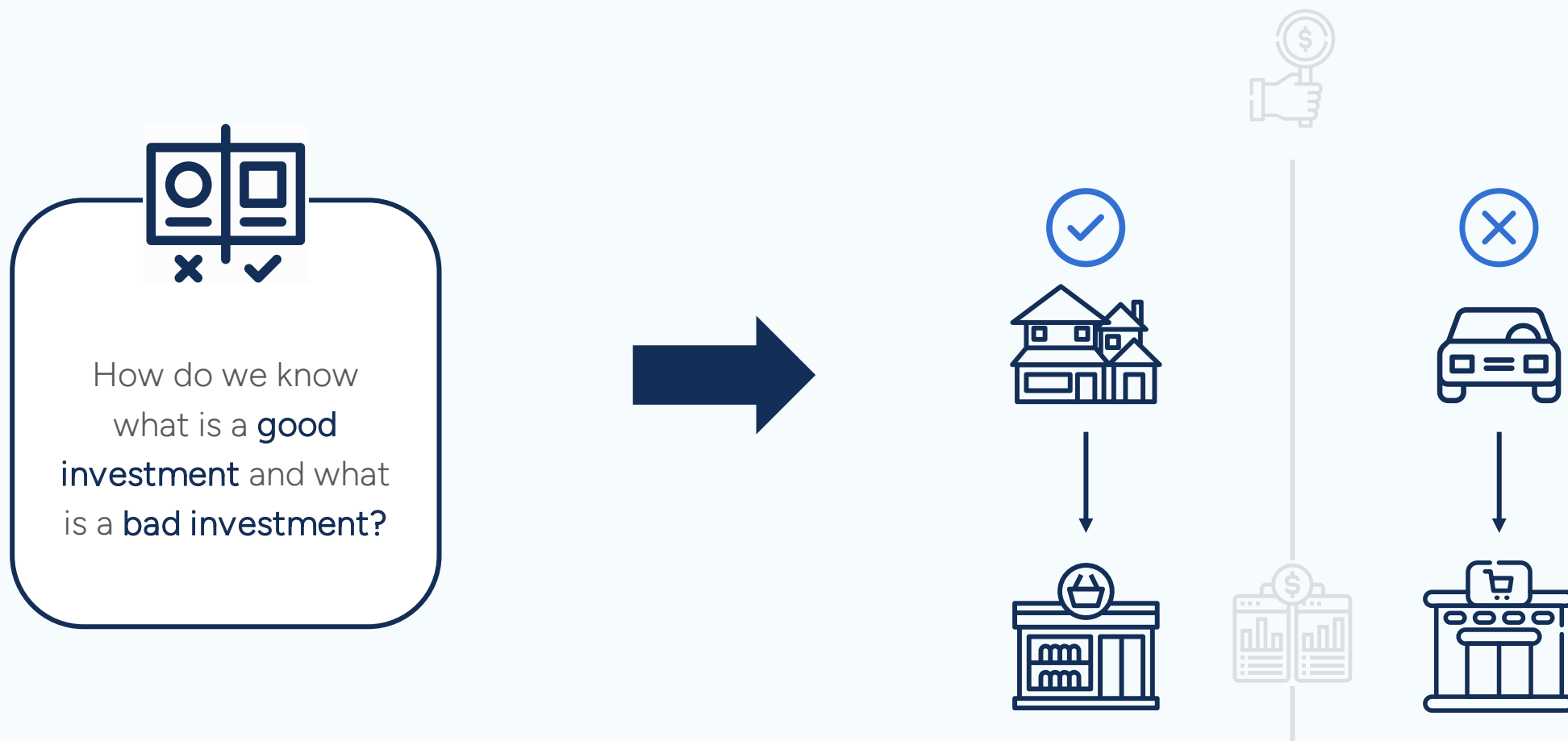


Calculate key outputs within the model structure.

Why Value Companies

What is Valuation

Valuation is the art and science of **attributing value** to an asset, investment, or company.



Why Perform Valuation

Valuing a Business for Investment Purposes



Selling a business



Acquiring a
business



Raising money
(i.e., IPO)



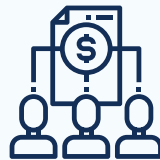
Investment
recommendations
(i.e., buy, hold, sell)



Internal business
decision-making



Impairment testing



Valuing employee
options and
compensation



Bankruptcy



Estate planning



Litigation

Valuation Is an Art and a Science



Science

Historical Financials
Ratios
Track Record
Statistical Analysis

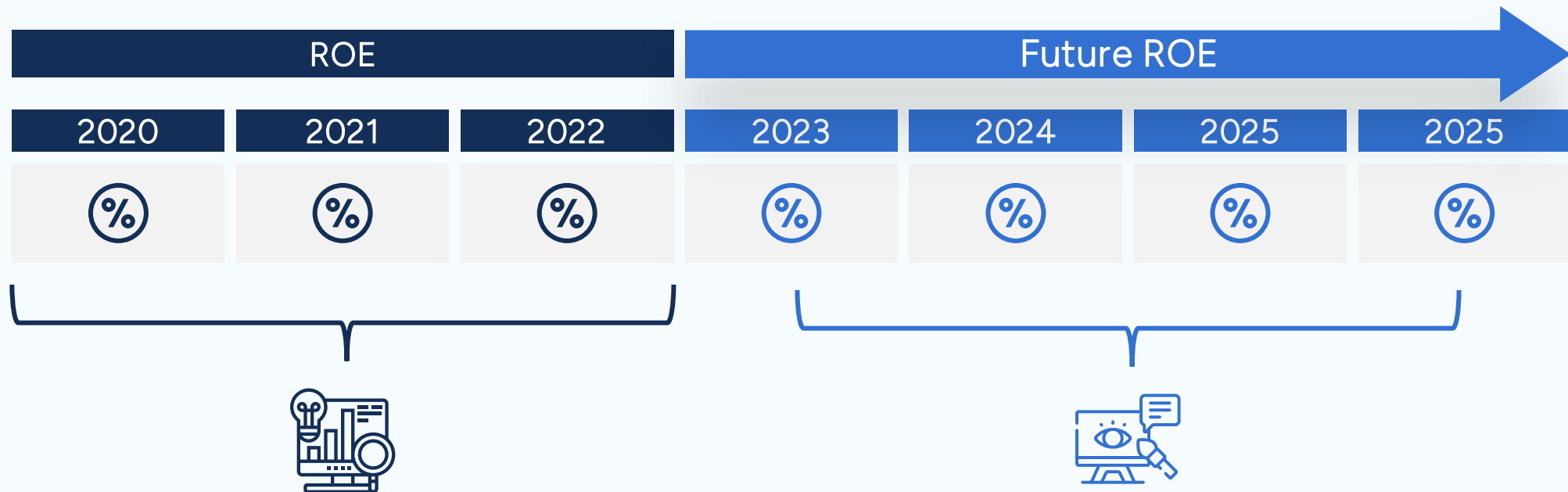


Art

Management Team
Culture and Strategy
"Moat"
Competition
Macroeconomic Factors
Cost of Capital
Forecasting

Valuation Is an Art and a Science

$$\begin{aligned}\text{Return on Equity (ROE)} &= \frac{\text{Net Income}}{\text{Shareholder's Equity}} \\ &= \text{\%}\end{aligned}$$



Valuation Is an Art and a Science

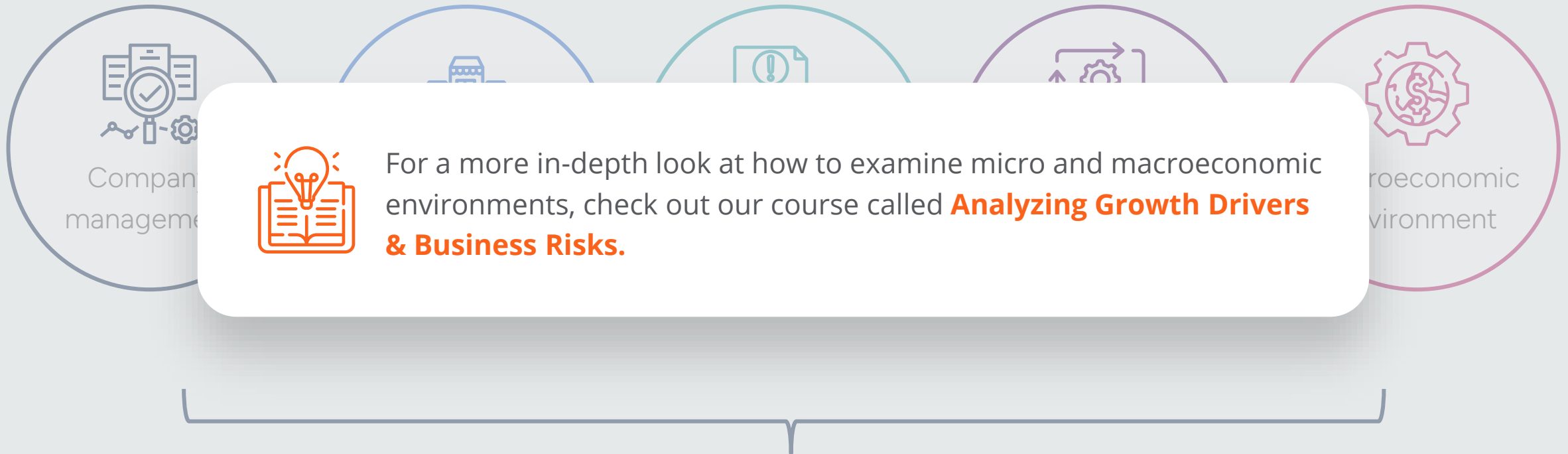
We must have a **deep understanding of the business and where it's going** for our forecast to be meaningful.



Based on this, we **apply acceptable valuation methods** to determine a company's worth.

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Valuation Techniques

Valuation Techniques



Asset Approach
(FMV of Net Assets)

- Cost to Build
- Replacement Cost
- Liquidation Value



Intrinsic Value
(Income Approach)

- Discounted Cash Flows (DCF)



Relative Value
(Market Approach)

- Public Company Comparables
- Precedent Transactions

Intrinsic Value – DCF



Intrinsic Value (Income Approach)

- Discounted Cash Flows (DCF)



Intrinsic valuation means **looking at a company in isolation** without worrying about peers.



Involves: forecasting future performance, calculating future cash flows, and discounting back to the present.



It doesn't directly depend on the mood of the market since we are **more focused on the fundamentals of the company.**

Relative Value – Public Company Comparables



Relative Value (Market Approach)

- Public Company Comparables
- Precedent Transactions



Peers are **generally easy to find** because these companies' shares are publicly traded on a stock exchange.



We **use multiples to find the worth of the company** we are trying to value (i.e., Price-to-earnings multiple).



It is **more likely to reflect the mood of the market** and produce a valuation that is closer to market price than DCF.

Relative Value – Precedent Transactions



Relative Value (Market Approach)

- Public Company Comparables
- Precedent Transactions



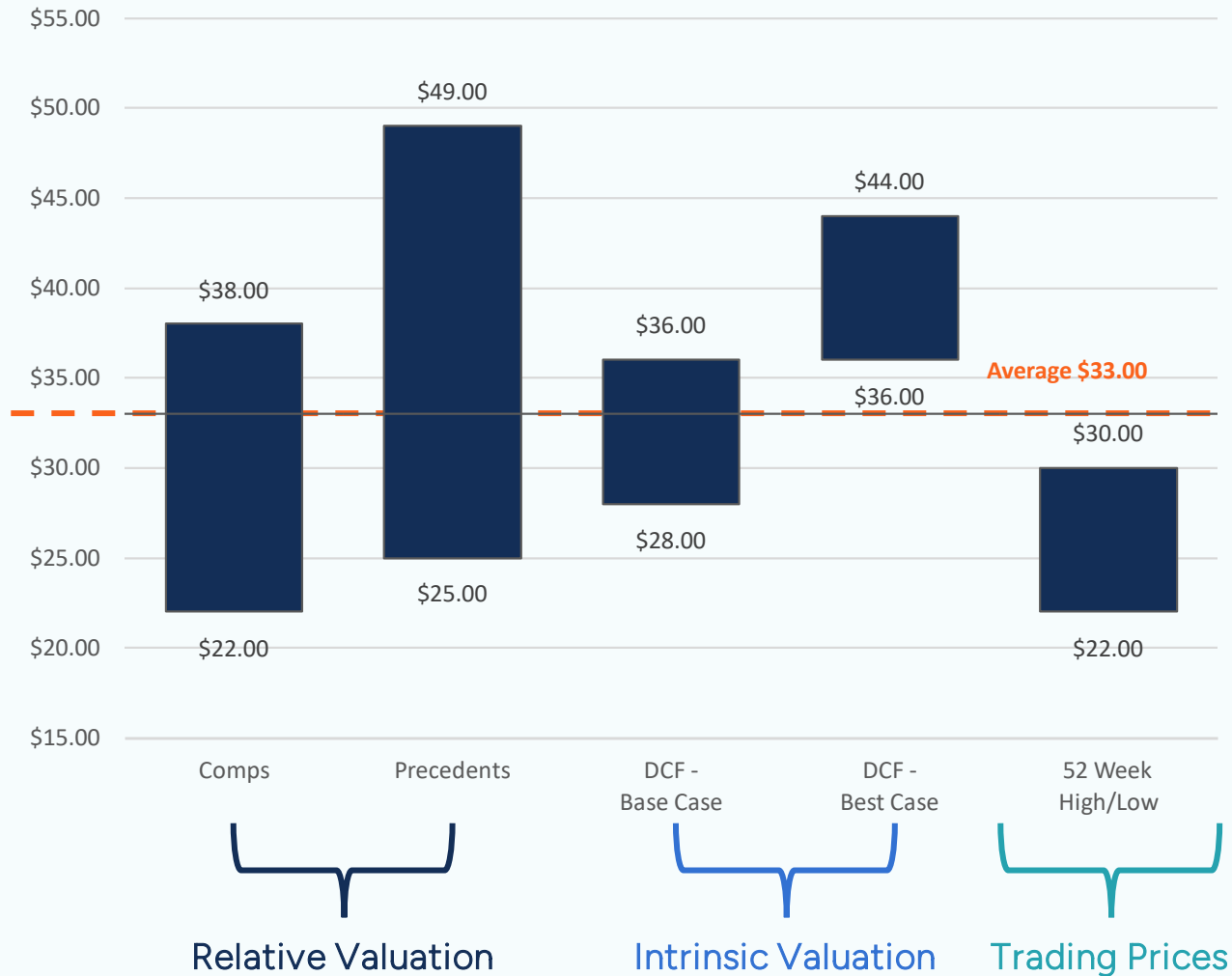
Precedent transactions relate to **past mergers and acquisitions**.



This form of valuation includes a **takeover premium** (generally, more money is paid for a controlling position).

Presenting Valuation Results

Football Field Chart



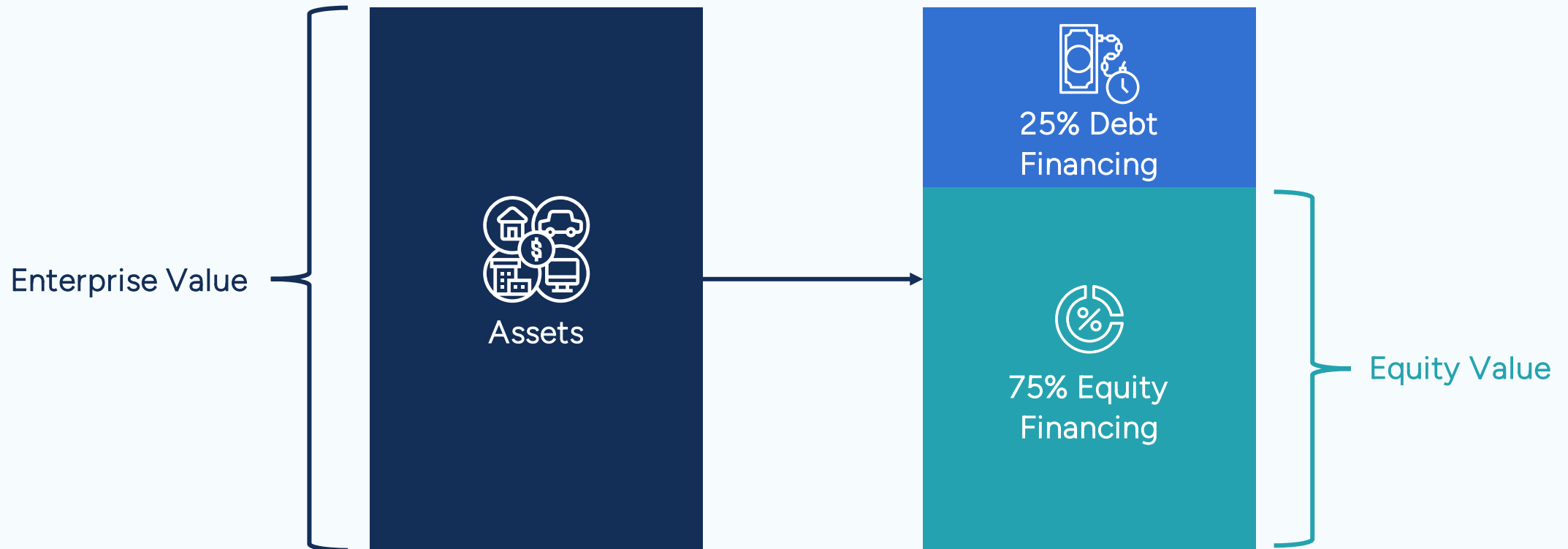
It's the job of analysts to weigh the different methods.



Value can never be truly observed, so we use all of these techniques.

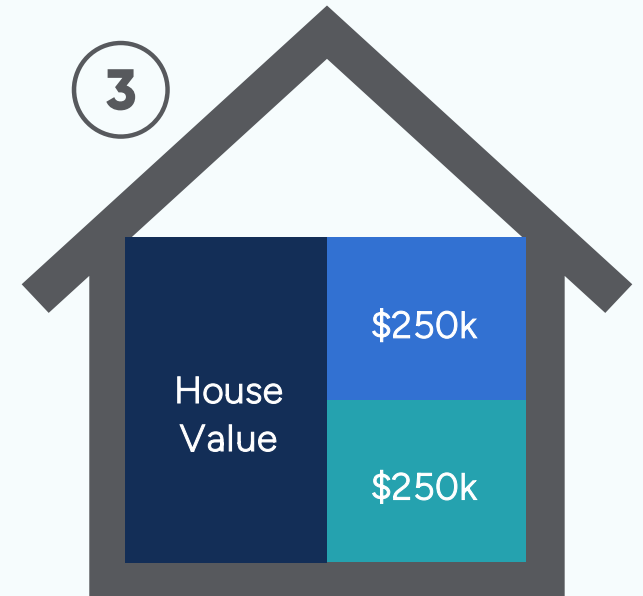
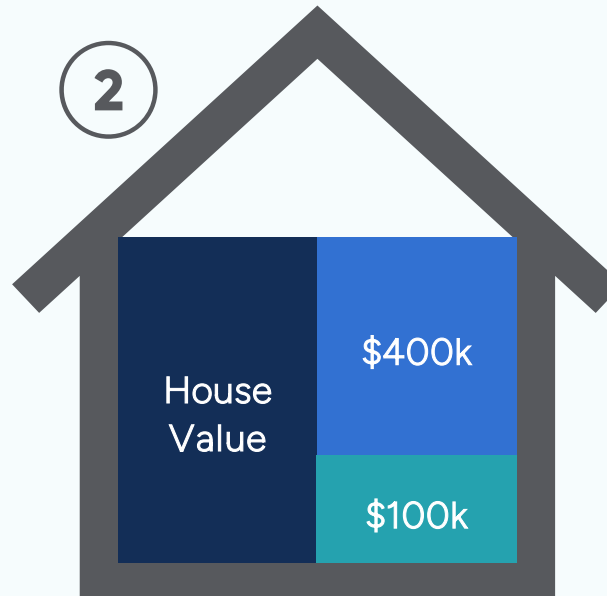
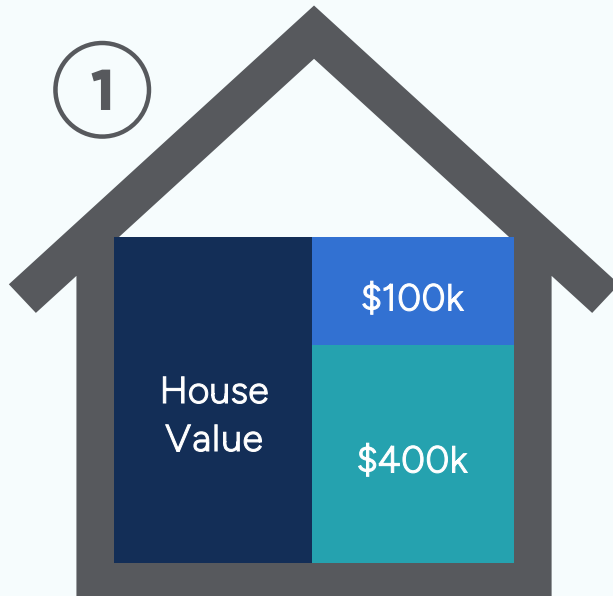
Enterprise Value vs. Equity Value

Enterprise Value vs. Equity Value



House Example

What are each of these houses worth?



Answer: \$500,000

- The **funding mix is independent of the value** of the house.
- The value of the house is what enterprise value reflects for companies.
- Regardless of how the house is financed, the price (or enterprise value) remains the same.

Calculating Enterprise Value

$$\text{Enterprise Value} = \text{Market Cap} + \text{Net Debt}$$

The diagram illustrates the formula for calculating Enterprise Value. It shows a dark blue box labeled "Enterprise Value" followed by an equals sign, then a blue box labeled "Market Cap", followed by a plus sign. To the right of the plus sign is a dashed teal box labeled "Net Debt" above it. Inside this dashed box, there is a teal box labeled "Debt" followed by a minus sign and then a purple box labeled "Cash".

- ✓ Bonds
- ✓ Revolving Credit Line
- ✗ Accounts Payable
- ✗ Deferred Revenues

Calculating Enterprise Value

$$\text{Enterprise Value} = \text{Market Cap} + \text{Net Debt}$$

Net Debt is defined as: Debt - Cash

Net Debt Defined (\$MM)

Short-term Interest-bearing Debt	5,000
Long-term Interest-bearing Debt	35,000
Gross Debt	40,000
Less: Cash and Cash Equivalents	10,000
Net Debt	30,000



Think about **cash as offsetting debt** because cash can be used to pay debt off.



Cash is **not included in firm value** as it is not an operating asset that generates cash.

Calculating Enterprise Value

$$\text{Enterprise Value} = \text{Market Cap} + \text{Net Debt}$$

Net Debt is defined as Debt minus Cash.

Net Debt Defined (\$MM)

Short-term Interest-bearing Debt	5,000
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Gross Debt	40,000
Less: Cash and Cash Equivalents	10,000
Net Debt	30,000

Net Debt (with positive net cash position) (\$MM)

Short-term Interest-bearing Debt	5,000
Long-term Interest-bearing Debt	0
Gross Debt	5,000
Less: Cash and Cash Equivalents	20,000
Net Debt	(15,000)
Net Cash	15,000

Advantages and Disadvantages

Let's look at the advantages and disadvantages of enterprise value and equity value.

Enterprise Value

- ✓ More useful when comparing companies with different capital structures.
- ✓ Minimizes accounting policies relative to net income and earnings per share.
- ✗ There are other debt and cash-like items that may be difficult to measure.
- ✗ Less useful for analyzing stocks since enterprise value is total business value, not equity value.

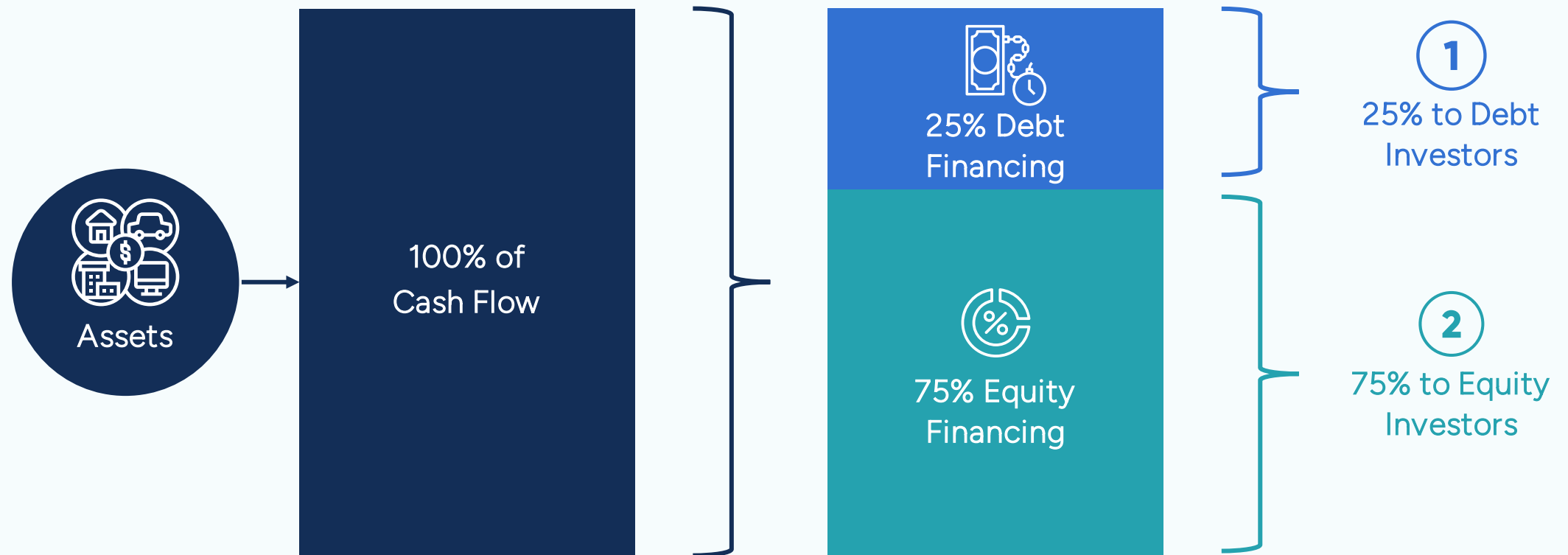
Equity Value

- ✓ More relevant to equity valuation, which is just a portion of a business.
- ✓ Requires less judgment than enterprise value, where there is debate over cash and debt.
- ✗ Multiples rely on accrual accounting, which can be manipulated.
- ✗ Different capital structures impact earnings, even if the businesses are otherwise identical.

Numerator/Denominator Consistency

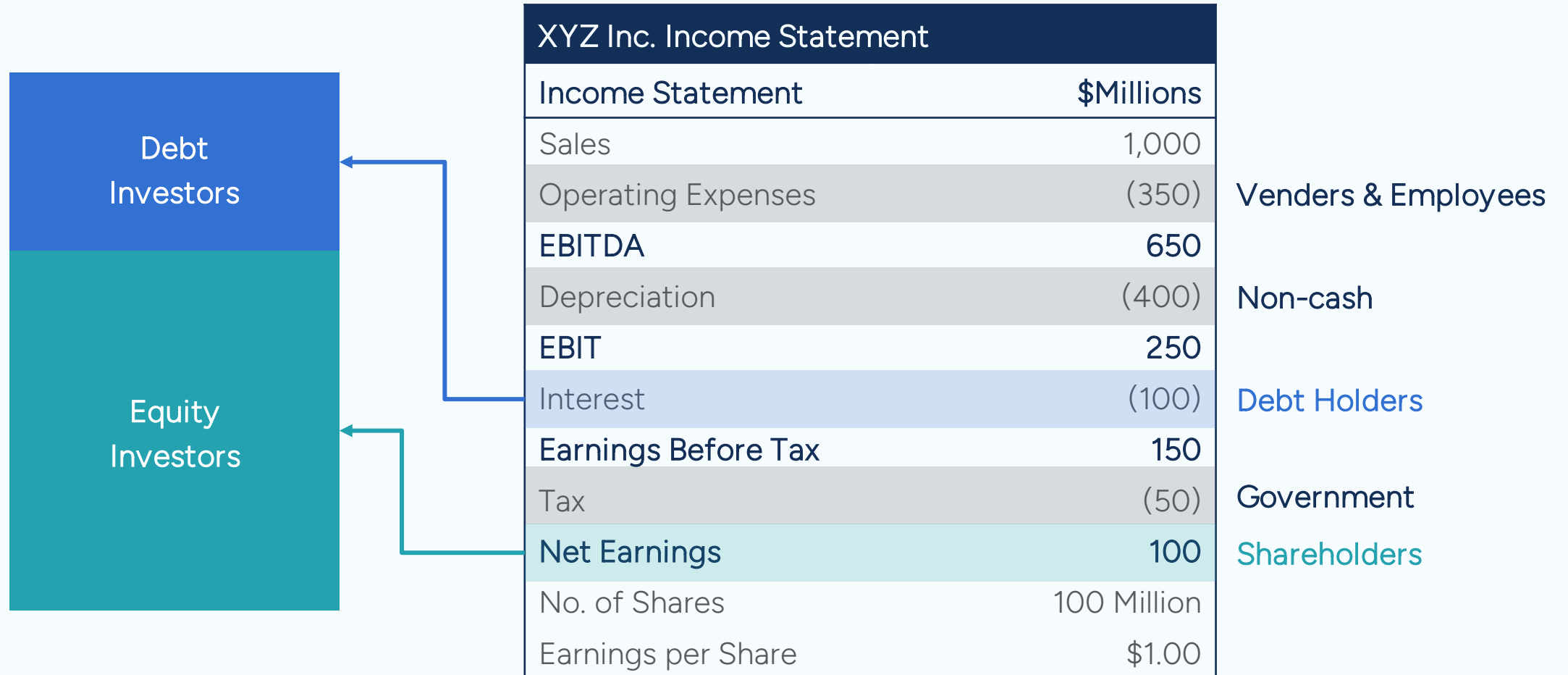
Valuation Consistency

We start with assets, which can be funded by either debt or equity.



Valuation Consistency

Now, let's look at how this really flows through the income statement.



Valuation Consistency

Now, let's look at how this really flows through the income statement.

XYZ Inc. Income Statement	
Income Statement	\$Millions
Sales	1,000
Operating Expenses	(350)
EBITDA	650
Depreciation	(400)
EBIT	250
<hr/>	
Interest	(100)
Earnings Before Tax	150
Tax	(50)
Net Earnings	100
No. of Shares	100 Million
Earnings per Share	\$1.00

If the denominator is **before** interest expense, it's an **enterprise value** multiple.

- EV/Sales
- EV/EBITDA
- EV/EBIT

If the denominator is **after** interest expense, it's an **equity value** multiple.

- P/E
- P/B

Discounted Cash Flow Valuation

Intrinsic Value

The intrinsic value of an asset or business is based on its future profits.



Where:

FV_n = Net cash flow for the n th period

i = Annual interest rate

n = Number of periods

Types of Free Cash Flows

There are two types of discounted cash flow calculations:



More
common in
practice



Unlevered Free Cash Flow (UFCF)

The cash flow that a
business has **before**
paying its debt
obligations.

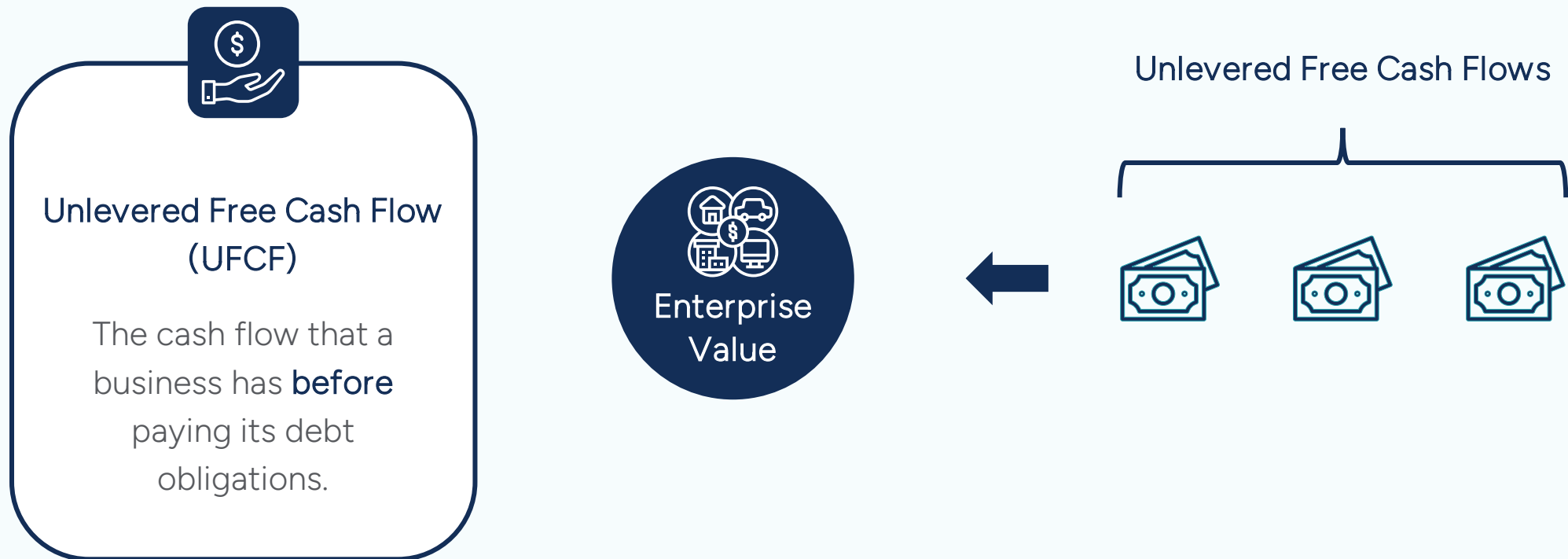


Levered Free Cash Flow (LFCF)

The cash flow a
business has **after** it
has met its debt
obligations.

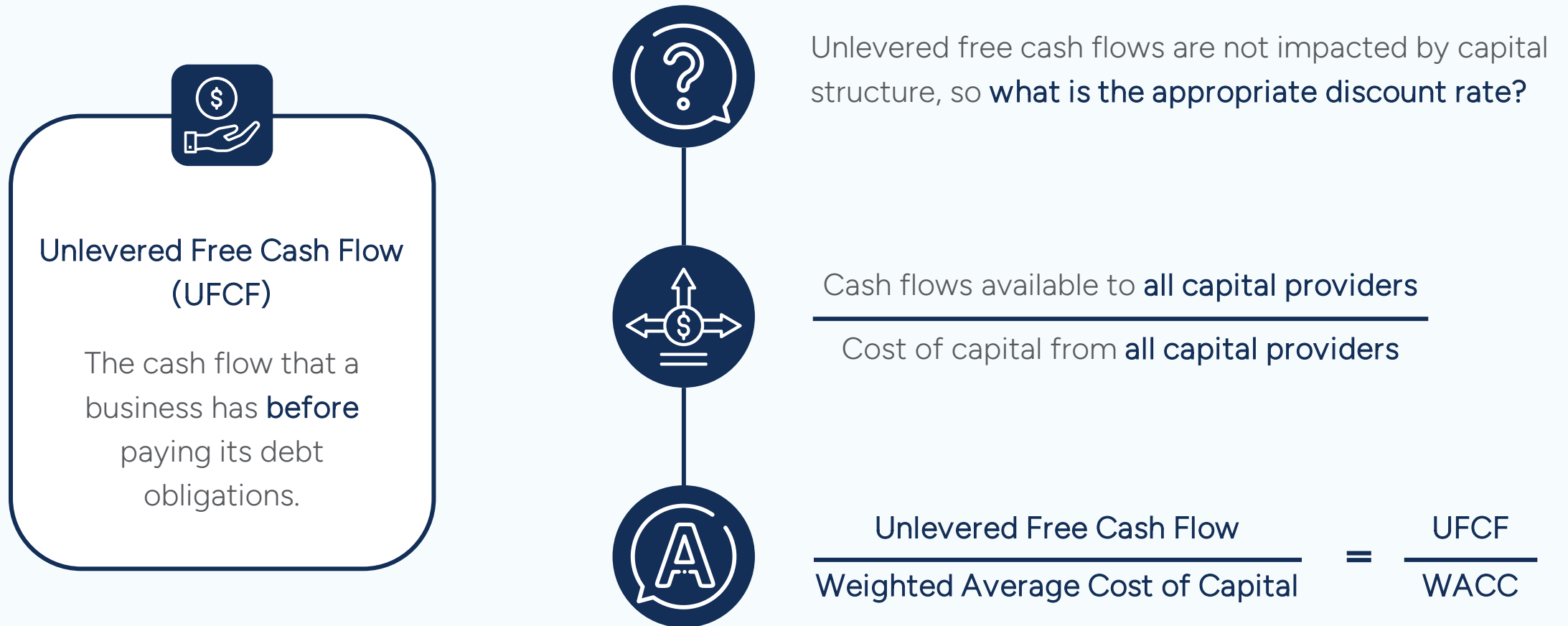
Numerator and Denominator Consistency

We need **consistency** between the numerator and denominator.



Numerator and Denominator Consistency

We need **consistency** between the numerator and denominator.



DCF Considerations



A DCF is **easiest** to use on a company that has **positive and fairly predictable** cash flows.



A DCF becomes more **difficult for younger companies** and companies that are in **financial distress**.



While a private company can be valued using a DCF, the **most difficult part is estimating a discount rate**.

Two Parts to a Typical DCF Forecast

The **further we predict** into the future, the **more prone to error** our estimates become.



Stage 1: Discrete Forecast

Time Period

- Typically covers a **period of 5 to 10 years**.

Description

- Involves **calculating free cash flows each year** based on projections.



Stage 2: Terminal Value

Time Period

- Assumes cash flows grow **infinitely** or company is acquired.

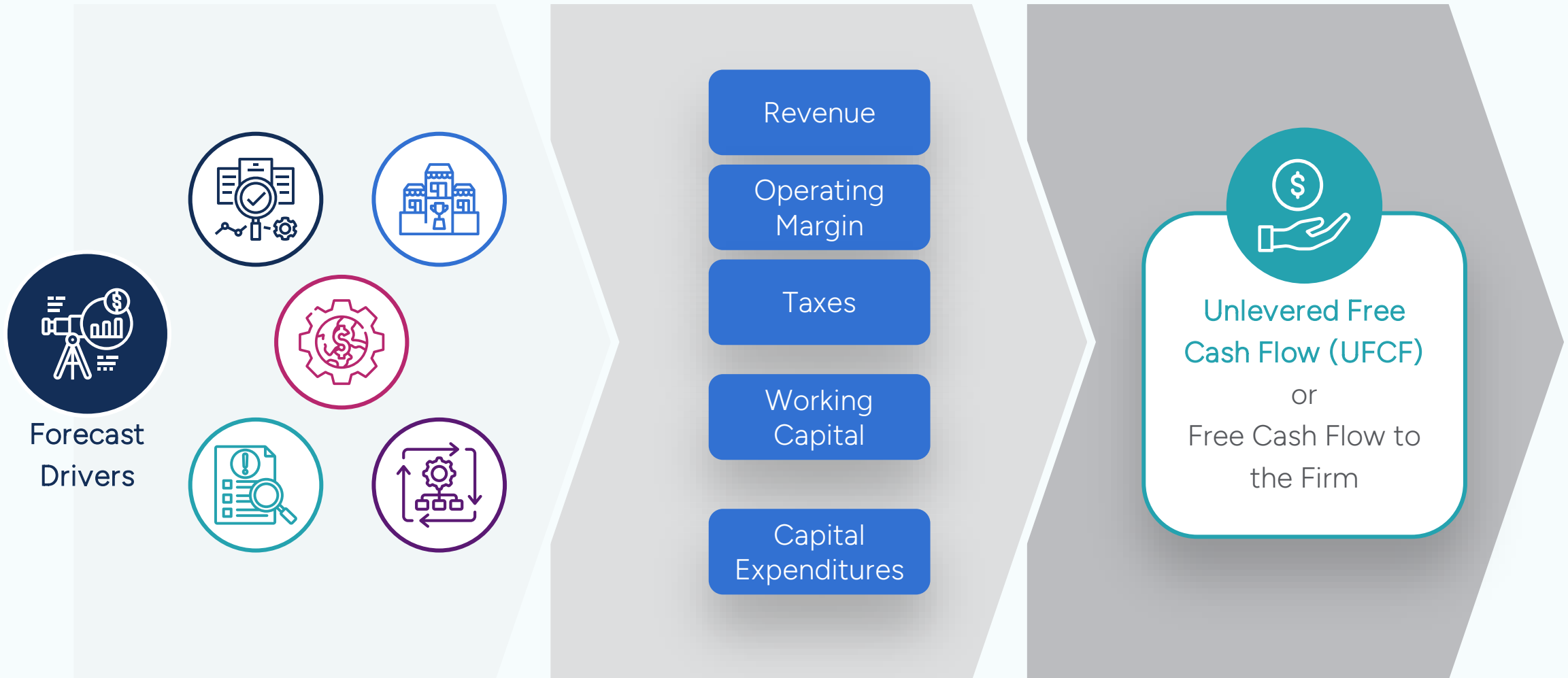
Description

- Assumes **cash flows grow at a steady rate** or acquired at some multiple.

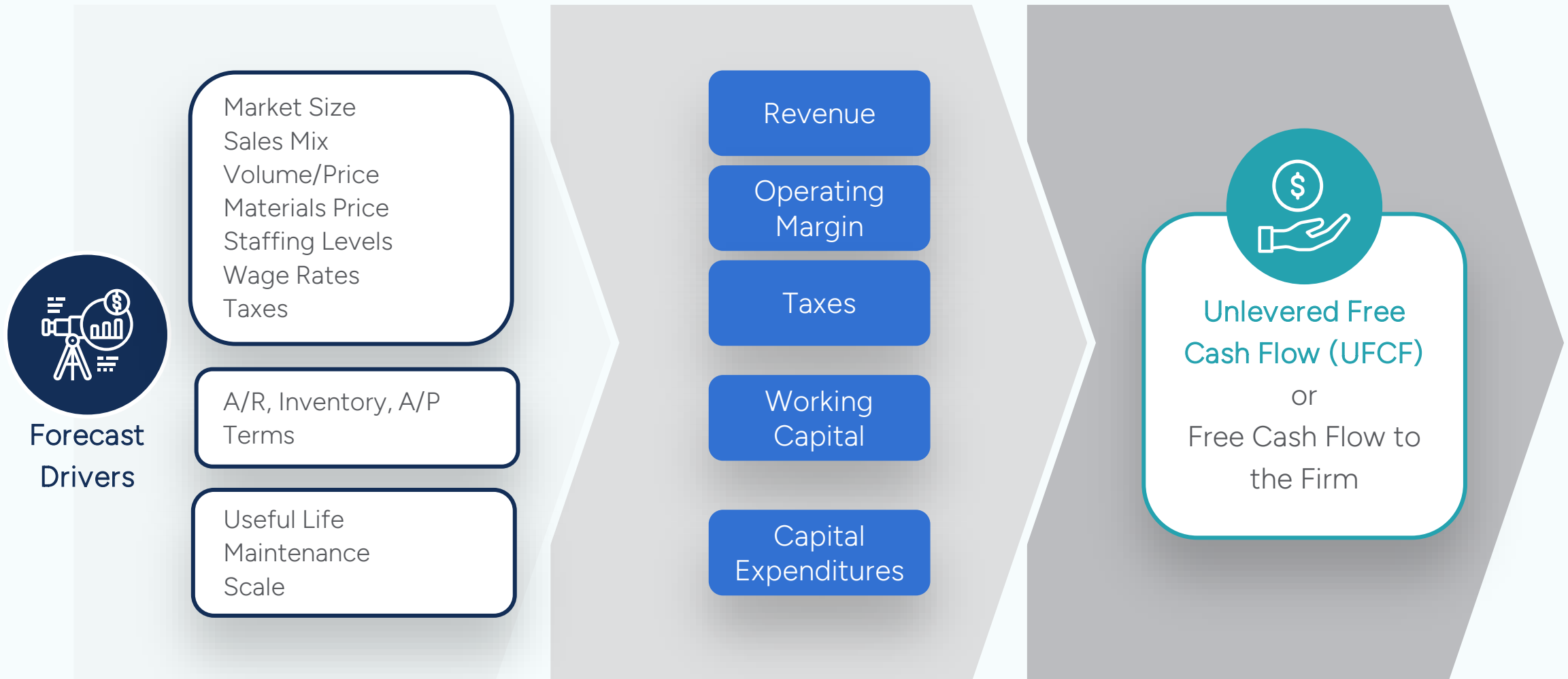


We will **discount all cash flows and the terminal value** back to the present at the appropriate discount rate.

Key Assumptions

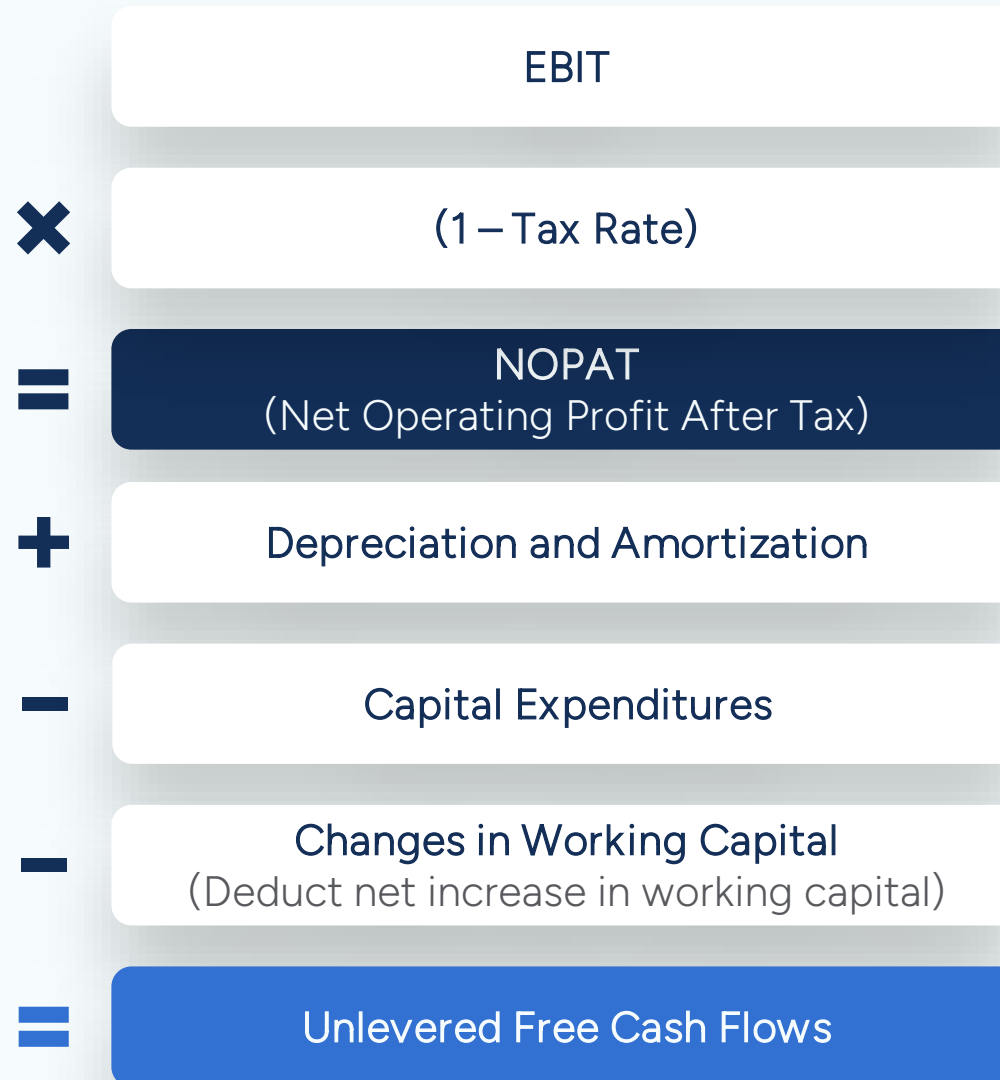


Key Assumptions



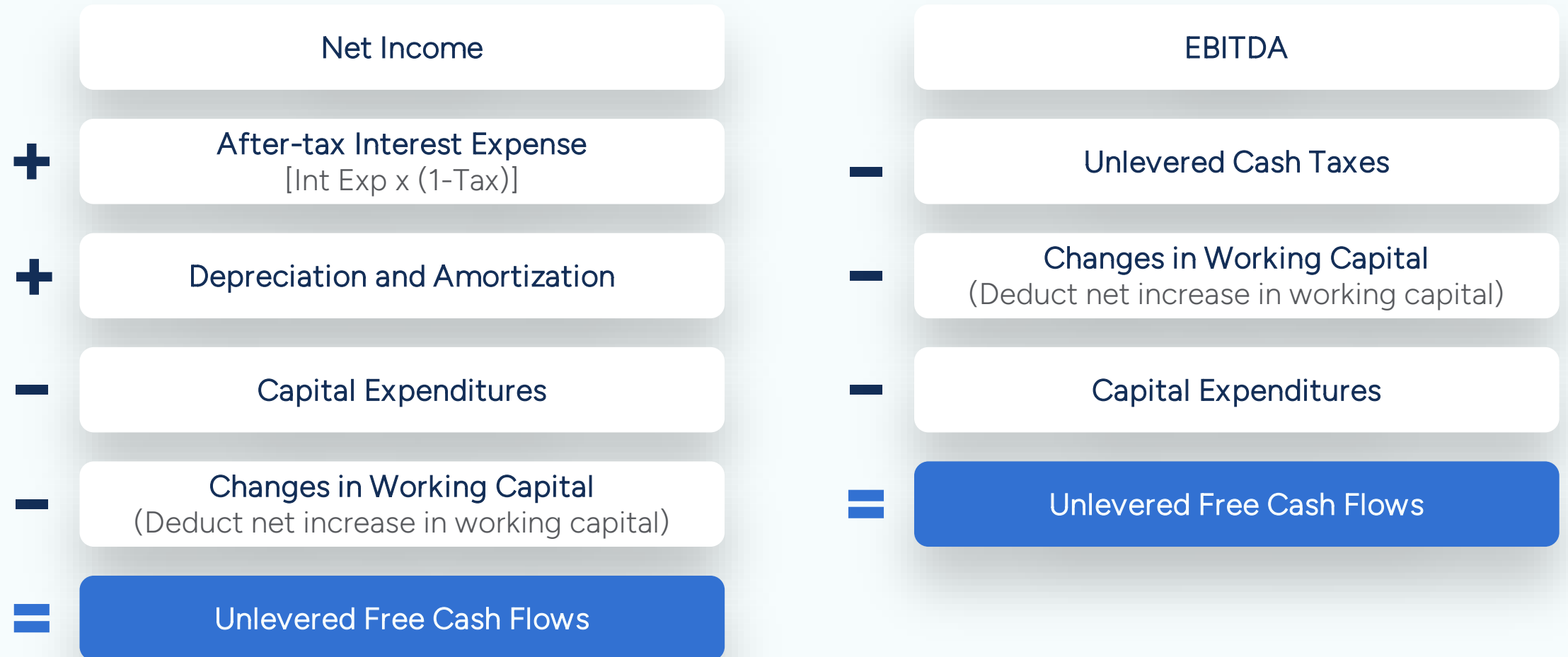
Unlevered Free Cash Flows

The EBIT method is most commonly used to calculate unlevered free cash flows.



Unlevered Free Cash Flows

There are two other methods to calculate unlevered free cash flows.



Cost of Capital

Risk Spectrum

High risk means the required rate of return is even higher.

Equity

High Risk

Corporate Debt

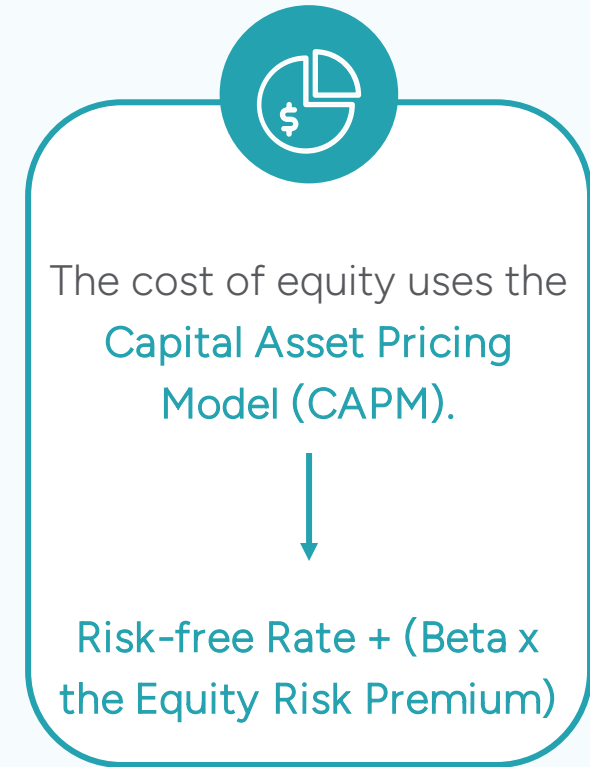
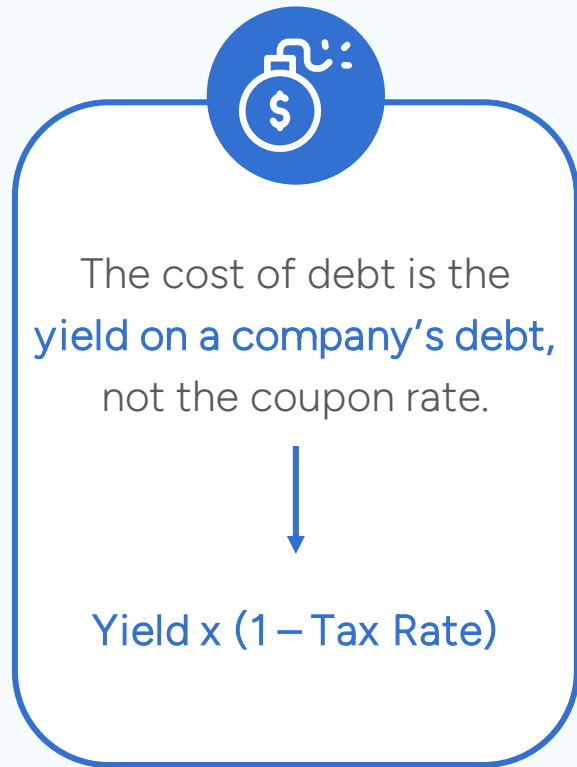
The required rate of return must be higher to compensate for taking on more risk.

Low risk means the required rate of return is low as well.

Government Bonds

Low Risk

Calculating WACC



Capital Asset Pricing Model (CAPM)

Risk-free Rate



Risk-free Rate

Normally the yield on a long-term government bond.

Free from default risk.

Premium



Beta

The output of a statistical regression that measures **change in a stock return vs. the overall market.**



Equity Risk Premium

This is the **return of the stock market over and above the risk-free rate.**

Usually **4% - 8%.**

Factors that Impact Cost of Equity

Let's analyze some **factors that impact the cost of equity** for a business.



Diversified portfolios of stocks are **only exposed to market risk**, or the beta.

β Beta

Market Risk

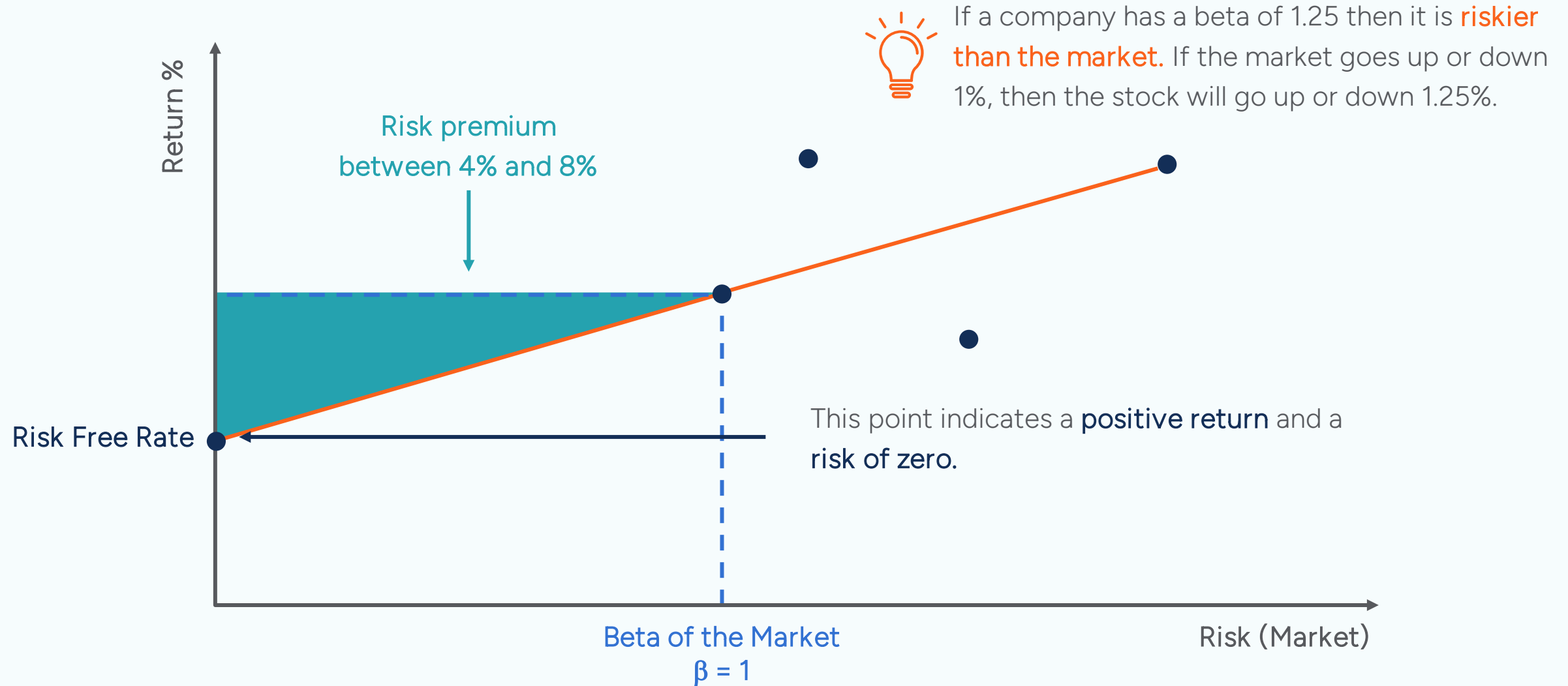
01. Interest Rates
02. Business/Economic Cycle
03. Inflation
04. Political/Legislation
05. Socio-economic

α Alpha

Firm-Specific Risk

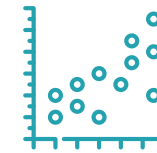
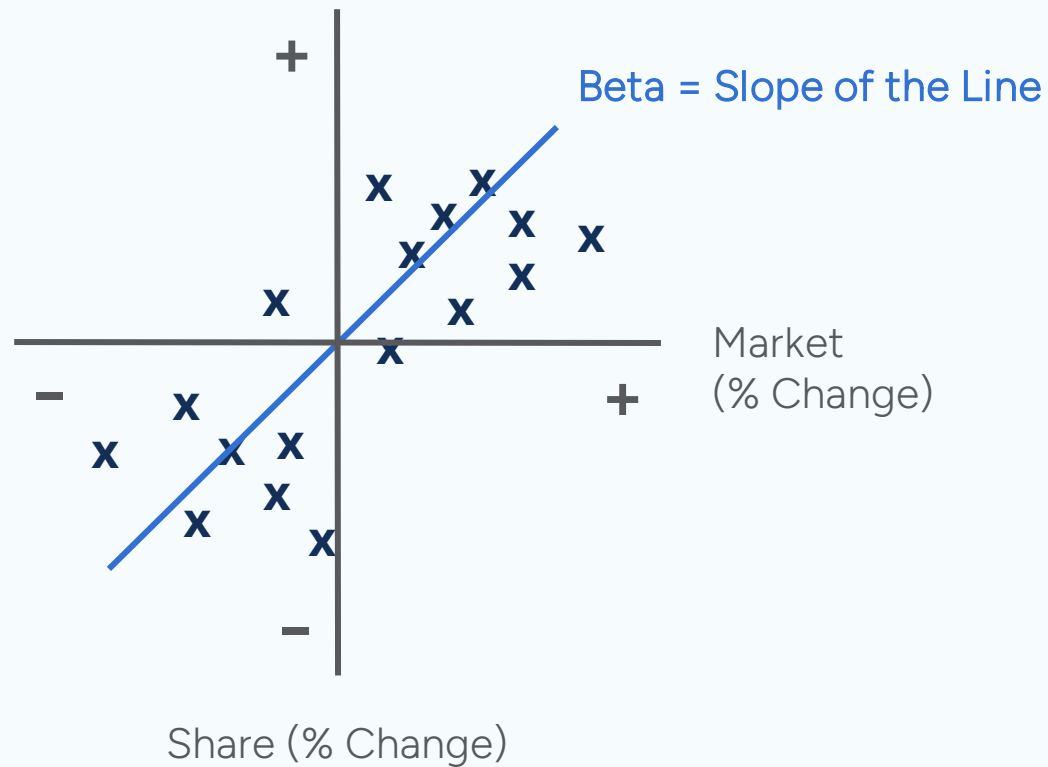
01. Management
02. Profits
03. Operations
04. Projects
05. Products

Understanding the CAPM



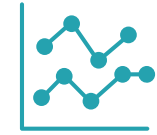
Beta

We can observe or calculate an individual company's Beta, but the **company's beta might not be meaningfully impacted by the overall stock market.**



R-Squared

R-Squared (R^2 or the coefficient of determination) is a statistical measure that **shows the goodness of fit.**



Correlation

Higher R^2 indicates **more correlation between the stock and the market.** If it is low, we might opt to use industry beta.

Industry Beta

If there is a low R-squared, we can improve our beta calculation by **calculating an industry beta**.

1

Unlever Beta

$$\frac{\text{Levered Beta}}{(1 + (1 - \text{tax rate}) \times (\text{Debt/Equity}))}$$

2

Take an **average or median**
of the unlevered betas

3

Re-lever Beta

$$\text{Unlevered Beta} \times (1 + (1 - \text{tax rate}) \times (\text{Debt/Equity}))$$

Terminal Value

Terminal Value Calculation Methods



Perpetuity
Growth Method

$$\text{Terminal Value} = \frac{\text{Last Forecast UFCF} \times (1 + g)}{(WACC - g)}$$



We will still have to discount this terminal value back to the present value.



Terminal Multiple
Method

$$\text{Terminal Value} = \text{Last Forecast EBITDA} \times \frac{EV}{EBITDA}$$



Still must discount this terminal value back to the present value.



Always assume this approach happens at the end of the year.

DCF Advantages and Disadvantages

Let's look at the advantages and disadvantages of discounted cash flow models.

Advantages

- ✓ Theoretically, the most "correct" way to value companies or investments.
- ✓ Provides an opportunity to learn about the company and industry.
- ✓ Less prone to market conditions (since it's an intrinsic valuation, not a relative one).

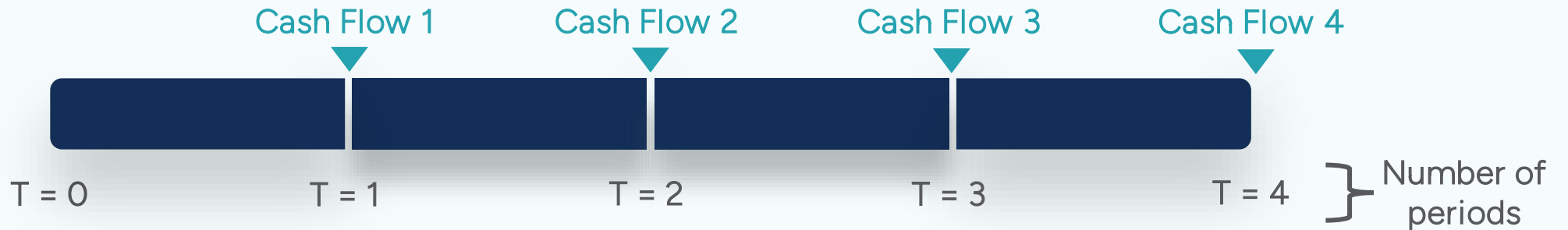
Disadvantages

- ✗ Requires a lot of inputs, and the model is only as good as those inputs.
- ✗ Given all of the inputs, it is easier to "manipulate" a DCF to a desired outcome.
- ✗ Greater complexity may give an analyst a false sense of precision.

NPV and IRR in Excel

Discounted Cash Flow Analysis – NPV Function

The NPV function is used in Excel to quickly calculate net present value.



Key Assumptions:

1. NPV discounts all cash flows.
2. Cash flows occur at regular intervals.
3. Cash flows occur at the end of the period.

Excel Syntax:

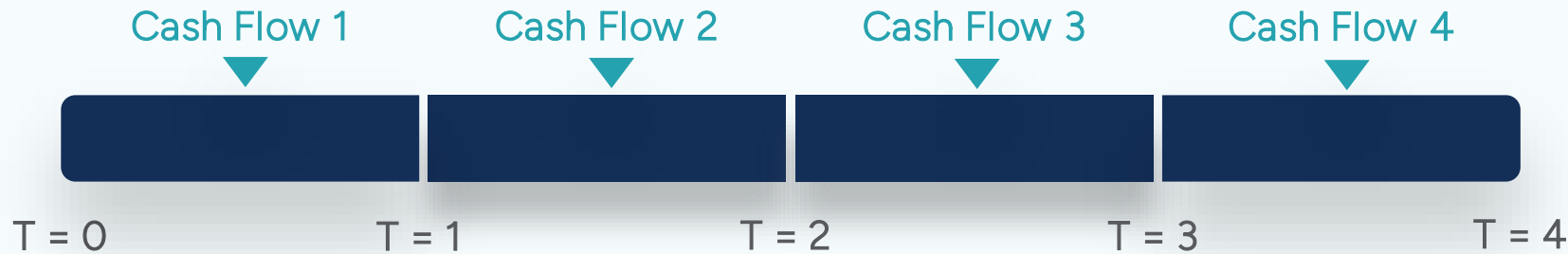
`=NPV(rate,value1,value2,...valuen)`

Where:

rate = The discount rate
value_n = Cash flows for the nth period
n = Number of periods

Discounted Cash Flow Analysis – Adjusted NPV Function

Mid-period discounting is **used to account for the inaccuracy of end-of-period cash flow timing** and assumes that cash flows occur at the midpoint of the period.



Key Assumptions:

1. NPV discounts all cash flows.
2. Cash flows occur at regular intervals.
3. Compounds cash flows at WACC by half a period.

Excel Syntax:

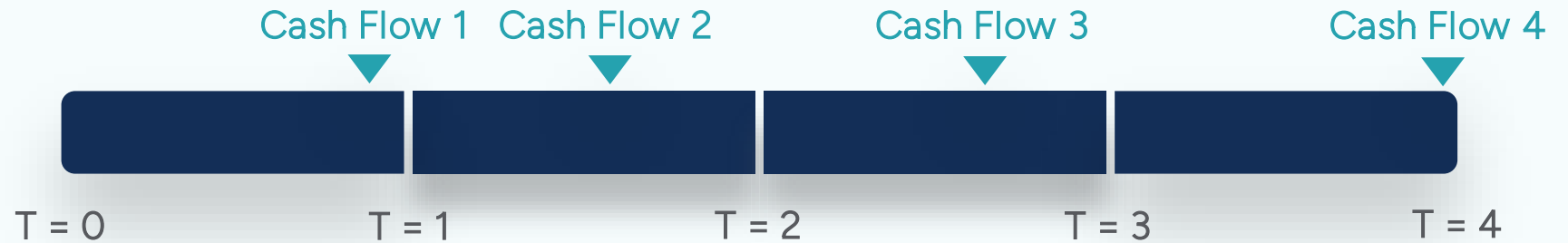
`=NPV(rate,value1,value2,...valuen) x (1 + rate)0.5`

Where:

- rate** = The discount rate
- value_n** = Cash flows for the nth period
- n** = Number of periods

Discounted Cash Flow Analysis – XNPV Function

The XNPV function is used when cash flows occur at irregular intervals.



Key Assumptions:

1. =XNPV() function discounts on a daily basis (i.e., each cash flow is discounted to the day on which it occurs).
2. The initial cash flow is not discounted.
3. Dates must correspond to the periodic cash flows.

Excel Syntax:

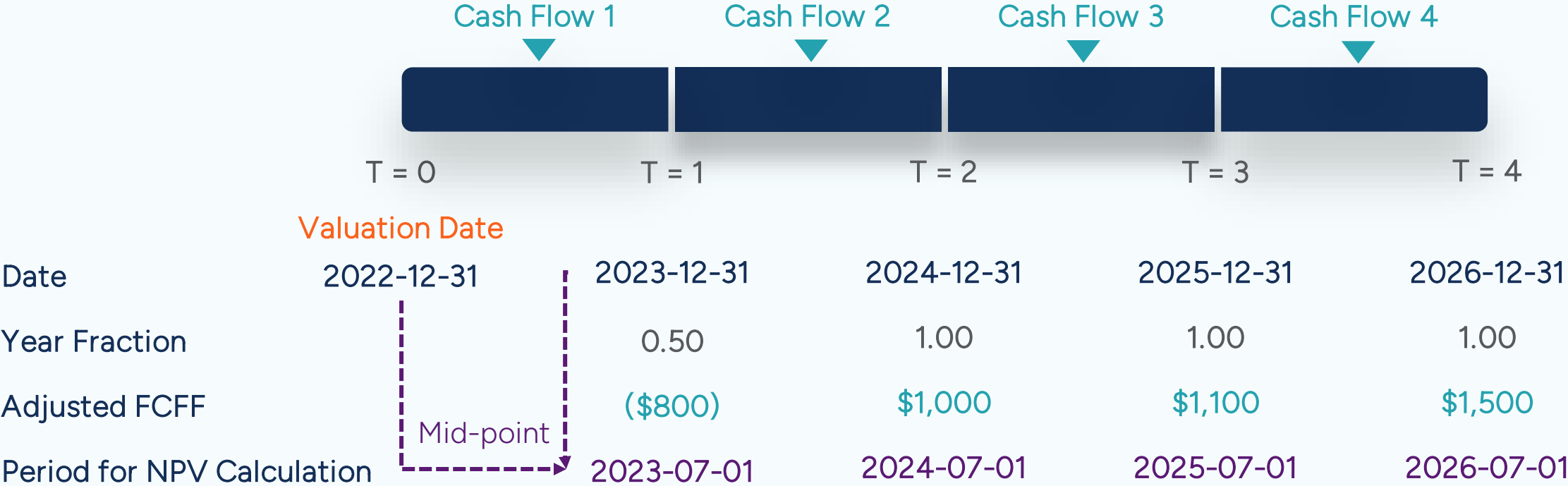
=XNPV(rate, values, dates)

Where:

- | | | |
|--------------------|---|---|
| rate | = | The discount rate |
| value _n | = | Cash flows for the n th period |
| dates | = | An array of dates corresponding to an array of payments |

Discounted Cash Flow Analysis – XNPV Function (Mid-point Discounting)

The =XNPV() function is also easily used when cash flows occur over a period. In calculating the NPV, one would choose a specific date that corresponds to the mid-point of the period.



Discount Rate = 10%

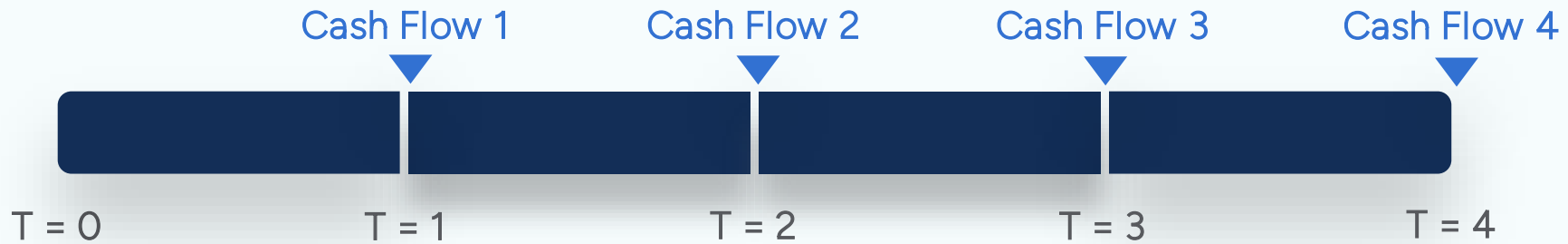
Excel Syntax:

PV of FCF = XNPV(rate, values, dates)

Internal Rate of Return – IRR Function

The internal rate of return, or IRR, is the discount rate that makes the **net present value of an investment equal to zero**.

In general, if the IRR is **greater than the cost of capital**, then the project **should be profitable**.



Key Assumptions:

1. The value inputs must contain at least one positive value and one negative value.
2. Values should be in chronological order.

Excel Syntax:

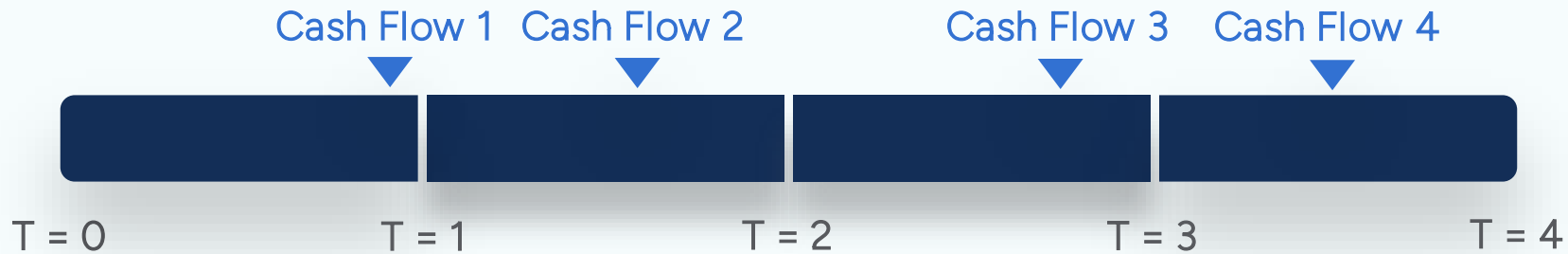
`=IRR(values, [guess])`

Where:

value_n = Cash flows for the nth period
guess = An estimate of the IRR

Internal Rate of Return – XIRR Function

The XIRR function is used when cash flows occur at irregular intervals.



Key Assumptions:

1. The value inputs must contain at least one positive value and one negative value.
2. Values should be in chronological order.
3. Dates must correspond to the periodic cash flows.

Excel Syntax:

=XIRR(values, dates, [guess])

Where:

- | | | |
|--------------|---|---|
| value | = | Cash flows for the n^{th} period |
| dates | = | An array of dates corresponding to an array of payments |
| guess | = | An estimate of the XIRR |

Relative Valuation

Relative Valuation

Under this methodology, the target company's **valuation is relative to other companies or transactions.**



Relative Valuation



Compares prices of similar assets to determine value.



Assumes other assets are priced correctly by market.



Public Company Comparables

Looks at the valuation for similar peer companies that are publicly traded.



Precedent Transactions

Looks at the acquisition prices for similar peer companies in recent transactions.

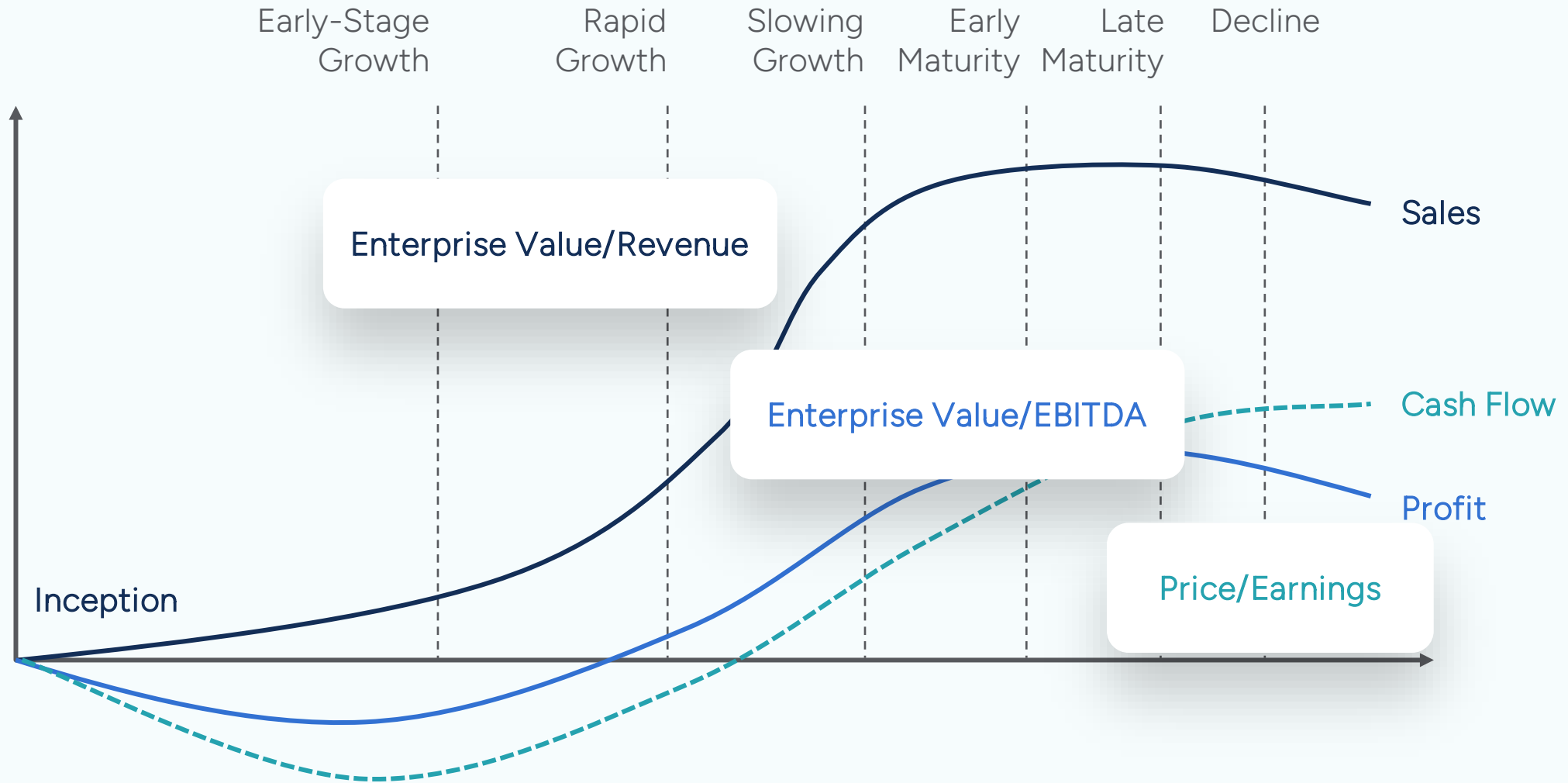


- Multiples are **ratios that scale companies by size.**
- Alternatively, we can see how a **company's multiple has changed over time.**

When Is a Multiple Appropriate

Multiple	Utility	Drawbacks
Enterprise Value/Revenue	Younger companies that haven't reached profitability	<ul style="list-style-type: none">Doesn't account for company's costsRevenue is an incomplete measure of performance
Enterprise Value/EBITDA	Investment banking and private equity Industries with large amounts of long-term assets	<ul style="list-style-type: none">EBITDA is not the "bottom line" that net income isEBITDA doesn't include any reinvestment in the business
Price/Earnings	Mature, publicly traded companies	<ul style="list-style-type: none">The denominator is based on accrual accounting which requires many assumptions (can be manipulated)
Price/Book	Financial service firms (e.g., banks)	<ul style="list-style-type: none">Limited usefulness for non-banks

Firm Life Cycle and Choosing Multiples



Relative Valuation Advantages and Disadvantages

Let's look at the advantages and disadvantages of relative valuation.

Advantages

- ✓ Calculating and applying multiples is relatively simple and user-friendly.
- ✓ Data is observable since we can directly look at a public company's market capitalization.
- ✓ Relative valuation reflects market conditions.
- ✓ Precedent transactions are useful for mergers and acquisitions due to the control premium.

Disadvantages

- ✗ Sometimes relative valuation can be too simplistic.
- ✗ Companies have lots of complex value drivers that multiples don't explicitly account for.
- ✗ Since no companies are exactly alike, relative valuation can be difficult and subjective.
- ✗ There are many reasons multiples, companies, and transactions may vary.

Differences in Multiples, Transactions & Companies



Growth Rates

Higher growth companies typically command a higher multiple and, thus, a higher valuation.



Management Team

Higher-quality businesses with better management should trade at higher multiples.



Mispricing

A company might simply be mispriced by investors and be under or overvalued.



Accounting Policies

Policies may impact accounting profits and, therefore, company multiples.



Older Deals

Outdated deals may not be representative of the current market for similar assets and companies.



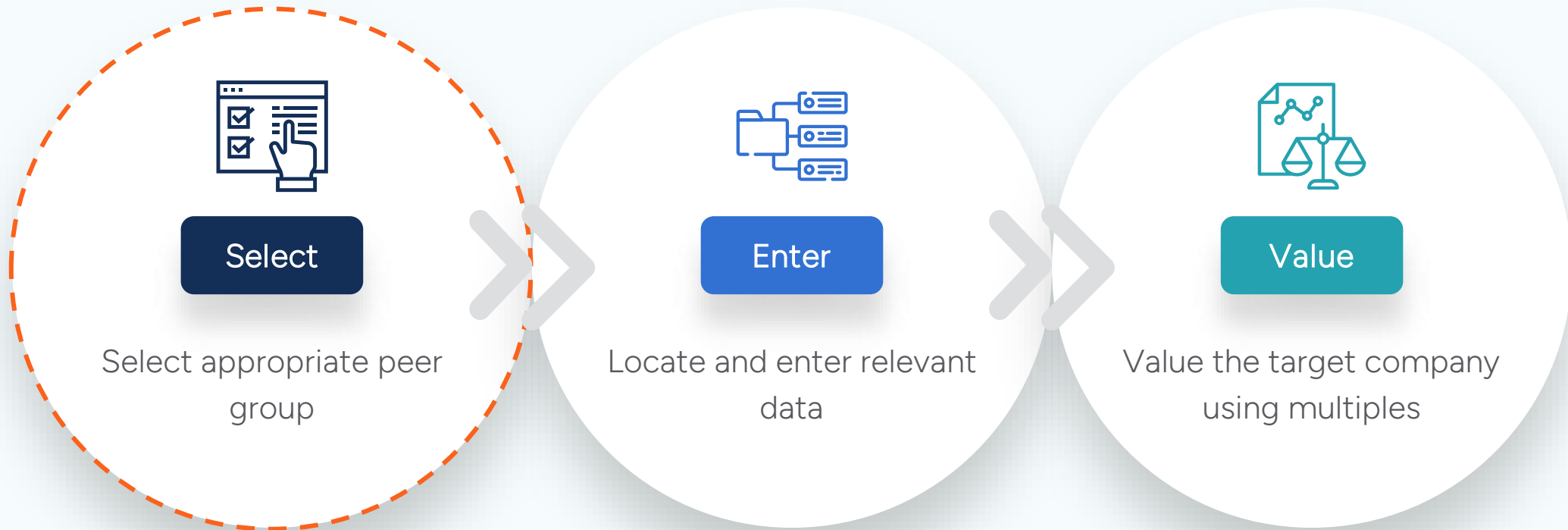
Inaccessibility

May be difficult to find transactions without a paid subscription or within a specific timeframe.

Comparable Company Valuation

Steps in Performing a Comparable Trading Analysis

We must thoroughly **understand the target's business** before going through a comparable company analysis.



Selecting comparables is the **most important part** of a comparable trading analysis.

Selecting Peer Companies

Let's go over what characteristics to look for when selecting the best comparables.



Industry



Geographic
Location



Size & Growth
Profiles



Profitability



Accounting
Policies



Capital
Structure

Selecting Peer Companies

	Company Name	Location	Business Description
✓	Alpha.com	Canada	Leading supermarket chain with over 200 locations. Specializes in middle-income consumers.
✓	Big Bucks Company	United States	Supermarket chain with over 500 locations, targeting lower or middle-income consumers.
✓	Centibillions Inc.	United States	Supermarket and discount chain with 150 locations.
✓	Deep Pockets Ltd.	United States	Owns several different supermarket concepts, mostly in smaller towns.
✓	Evergreen Co.	Canada	75-location supermarket chain serving the central Provinces in Canada (for example, Manitoba and Saskatchewan).
✓	Fat Cat Inc.	Canada	Supermarket and discount chain with 100 locations.

Selecting Peer Companies


	Company Name	Location	Business Description
⊗	Nav Inc.	United States	High-end supermarket chain, primarily in wealthy cities on the coasts.
⊗	JJ Co.	Canada	Large supermarket chain targeting middle-income consumers. Also has 400 gas stations.
⊗	LRM Ltd.	Ghana	Large supermarket chain with 200 locations.
⊗	Zhao Ltd.	China	Large supermarket chain with 700 locations.



We can further screen by looking at **different financial metrics** like growth rates, leverage, margins, etc..

Selecting Peer Companies


	Company Name	Location	Business Description
⊗	Nav Inc.	United States	Market chain, primarily in wealthy cities on the East Coast.
⊗	JJ Co.	Canada	Market chain targeting middle-income customers with 400 gas stations.
⊗	LRM Ltd.	Canada	Market chain with 200 locations.
⊗	Zhao Ltd.	China	Market chain with 700 locations.



Precedent Transactions

The analysis is similar for performing a precedent transactions valuation, but we also include:

- Acquisition timing
- Control premium
- Type of buyer



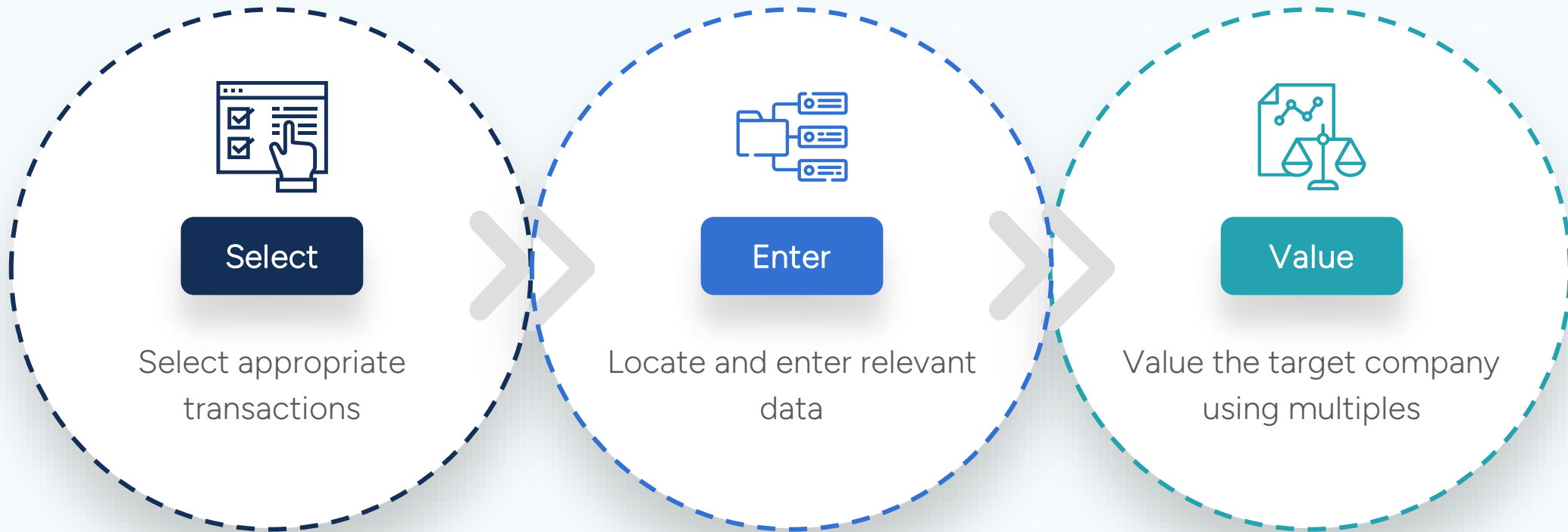
We can also analyze the company's **current financial metrics** like growth rates, leverage, margins, etc..

Selecting Peer Companies

Financial Data		Trading Multiples		Operating Statistics		Business Description		Implied Valuation		Valuation Chart		Credit Health Panel	
Options ▼		+ Add Companies		+ Display Options		Currency: US Dollar		Data as of: 03/22/2023					
Apple Inc. (NasdaqGS:AAPL) Technology Hardware, Storage and Peripherals (Primary) Consumer Discretionary Financials Communication Services													
<input type="checkbox"/>				Company Name		TEV/Total Revenues LTM - Latest	TEV/EBITDA LTM - Latest	TEV/EBIT LTM - Latest	P/Diluted EPS Before Extra LTM - Latest	P/TangBV LTM - Latest	NTM TEV/Forward Total Revenue (Capital IQ)	NTM TEV/Forward EBITDA (Capital IQ)	NTM Forward P/E (Capital IQ)
<input type="checkbox"/>				Amazon.com, Inc. (NasdaqGS:AMZN)		2.2x	17.1x	90.8x	NM	8.4x	1.99x	12.86x	68.90x
<input type="checkbox"/>				Alphabet Inc. (NasdaqGS:GOOGL)		4.4x	13.2x	16.7x	22.7x	5.9x	4.17x	10.75x	20.20x
<input type="checkbox"/>				Microsoft Corporation (NasdaqGS:MSFT)		9.8x	19.9x	24.0x	30.3x	19.3x	9.16x	18.84x	27.50x
<input type="checkbox"/>				Dell Technologies Inc. (NYSE:DELL)		0.5x	7.2x	8.4x	11.8x	NM	0.55x	5.13x	7.16x
<input type="checkbox"/>				HP Inc. (NYSE:HPQ)		0.6x	6.4x	7.9x	11.0x	NM	0.68x	6.79x	8.09x
<input type="checkbox"/>				Hewlett Packard Enterprise Company (NYSE:HPE)		1.0x	5.7x	11.4x	22.3x	9.8x	1.02x	5.56x	7.41x
<input type="checkbox"/>				NetApp, Inc. (NasdaqGS:NTAP)		2.0x	9.0x	11.2x	10.7x	NM	2.07x	7.97x	11.36x
<input type="checkbox"/>				QUALCOMM Incorporated (NasdaqGS:QCOM)		3.4x	8.8x	10.0x	11.7x	21.2x	3.63x	9.47x	12.10x
<input type="checkbox"/>				Advanced Micro Devices, Inc. (NasdaqGS:AMD)		6.5x	31.7x	120.8x	116.2x	25.8x	6.51x	21.64x	31.99x
<input type="checkbox"/>				Western Digital Corporation (NasdaqGS:WDC)		1.1x	9.2x	19.0x	NM	5.7x	1.34x	22.20x	NM
<input type="checkbox"/>				Apple Inc. (NasdaqGS:AAPL)		6.3x	17.2x	21.4x	26.9x	44.1x	6.13x	19.34x	25.43x
Displaying 11 Companies.													
				Summary Statistics		TEV/Total Revenues LTM - Latest	TEV/EBITDA LTM - Latest	TEV/EBIT LTM - Latest	P/Diluted EPS Before Extra LTM - Latest	P/TangBV LTM - Latest	NTM TEV/Forward Total Revenue (Capital IQ)	NTM TEV/Forward EBITDA (Capital IQ)	NTM Forward P/E (Capital IQ)
				High		9.8x	31.7x	120.8x	116.2x	25.8x	9.16x	22.20x	68.90x
				Low		0.5x	5.7x	7.9x	10.7x	5.7x	0.55x	5.13x	7.16x
				Mean		3.1x	12.8x	32.0x	29.6x	13.7x	3.11x	12.12x	21.64x
				Median		2.1x	9.1x	14.1x	17.0x	9.8x	2.03x	10.11x	12.10x

Precedent Transaction Valuation

Steps in Performing a Precedent Transaction Analysis



Determining appropriate transactions is the **most important part** of this analysis.



The **data may be hard to find** depending on the transaction.



Usually has the **highest valuation** due to the control premium.

Selecting Relevant Transactions

Let's go over what characteristics to look for when selecting the best comparables.



Recent Deals

Try not to use older transactions **as industries and market conditions change**. However, older deals may be necessary for a robust valuation.



Buyer Awareness

Is it a strategic buyer that operates in the same or adjacent industry, or is the buyer a financial firm like private equity?



Strategic buyers are able to **pay more due to synergies** in an acquisition.



Private Equity buyers likely to **pay less since they keep management** in place.

Selecting Relevant Transactions

Let's go over what characteristics to look for when selecting the best comparables.



Recent Deals

Try not to use older transactions **as industries and market conditions change**. However, older deals may be necessary for a robust valuation.



Buyer A

Is it a strategic buyer?
Is the buyer in the same industry, or



Enterprise value is effectively the **purchase price**.



Strategic buyers are able to **pay more due to synergies** in an acquisition.



Private Equity buyers likely to **pay less since they keep management** in place.

Appendix

Implied Growth Rate and Implied Terminal Multiple

Formula for terminal value (TV) using perpetuity growth method

Factor FCF

Multiply both sides of the equation by (WACC – g)

Factor Terminal Value

Move FCF to other side of the equation

Move TV x g to other side of the equation

Factor out g

Divide both sides by (FCF + TV)

$$TV = \frac{FCF \times (1 + g)}{(WACC - g)}$$

$$TV = \frac{(FCF + FCF \times g)}{(WACC - g)}$$

$$TV \times (WACC - g) = FCF + FCF \times g$$

$$TV \times WACC - TV \times g = FCF + FCF \times g$$

$$TV \times WACC - TV \times g - FCF = FCF \times g$$

$$TV \times WACC - FCF = FCF \times g + TV \times g$$

$$TV \times WACC - FCF = g (FCF + TV)$$

$$\frac{(TV \times WACC - FCF)}{(FCF + TV)} = g$$

Implied Growth Rate and Implied Terminal Multiple

Formula for terminal value (TV) using perpetuity growth method

$$TV = \frac{FCF \times (1 + g)}{(WACC - g)}$$

Factor FCF

$$TV = \frac{(FCF + FCF \times g)}{(WACC - g)}$$

Multiply both sides by (WACC - g)

For mid-period discounting we need to adjust our terminal value, as seen below:

$$g = \frac{((TV / (1 + WACC)^{0.5}) \times WACC - FCF)}{(FCF + (TV / (1 + WACC)^{0.5}))}$$

Move TV x g to other side of the equation

$$TV \times WACC - FCF = FCF \times g + TV \times g$$

Factor out g

$$TV \times WACC - FCF = g (FCF + TV)$$

Divide both sides by (FCF + TV)

$$\frac{(TV \times WACC - FCF)}{(FCF + TV)} = g$$

Implied Growth Rate and Implied Terminal Multiple

Formula for terminal value (TV) using perpetuity growth method

$$TV = \frac{FCF \times (1 + g)}{(WACC - g)}$$

Factor FCF

$$TV = \frac{(FCF + FCF \times g)}{(WACC - g)}$$

Multiply both sides by (WACC - g)

For mid-period discounting we need to adjust our terminal value, as seen below:

$$\frac{(TV \times WACC - FCF)}{(FCF + TV)} = g \quad \longrightarrow \quad g = \frac{((TV / (1 + WACC)^{0.5}) \times WACC - FCF)}{(FCF + (TV / (1 + WACC)^{0.5}))}$$

Move TV x g to other side of the equation

$$TV \times WACC - FCF = FCF \times g + TV \times g$$

Factor out g

$$TV \times WACC - FCF = g (FCF + TV)$$

Divide both sides by (FCF + TV)

$$\frac{(TV \times WACC - FCF)}{(FCF + TV)} = g$$

Implied Growth Rate and Implied Terminal Multiple

Formula for terminal value (TV) using perpetuity growth method



$$\frac{FCF \times (1 + g)}{(WACC - g)}$$

Implied Terminal Value Multiple **(End of Period)**



$$\frac{\left[\frac{FCF \times (1 + g)}{(WACC - g)} \right]}{\text{Last Forecasted EBITDA}}$$

Implied Terminal Value Multiple **(Middle of Period)**



$$\frac{\left[\frac{FCF \times (1 + g)}{(WACC - g)} \right] \times (1 + WACC)^{0.5}}{\text{Last Forecasted EBITDA}}$$

Levered Free Cash Flows

Remember when we perform a DCF we only discount future free cash flows.

